

Appl. No. 10/524,398
Amtd. Dated December 17, 2010
Reply to Office Action of June 17, 2010

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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A liquid ejection apparatus comprising:
a line head having a plurality of liquid ejection unit heads, each unit head having a plurality of ink ejecting nozzles and two or more ink ejecting elements associated with each ink ejecting nozzle, the ink ejecting nozzles being arranged in groups by unit heads such that each unit head includes a single group of ink ejecting nozzles;

principal control means for separately controlling members of each group of ink ejecting nozzles based upon a default operating condition for the respective unit head as manufactured such that substantially the same current values are supplied to the individual ink ejecting elements for each group, wherein current that is supplied to each of the ink ejecting elements of a nozzle in the group is either the same or a different value as set by the principal control means; and

auxiliary control means for modifying the default operating condition for at least one group of ink ejecting nozzles relative to the remaining groups of ink ejecting nozzles such that currents different from the default condition are supplied to the ink ejecting elements of the at least one group of ink ejecting nozzles, and further wherein the principal control means operates to generate a principal ink ejection direction that is altered relative to other ink ejecting

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heads depending upon a detected result, and further wherein each of the unit heads has a different modified default operating condition.

Claims 2. - 11. (Canceled)

12. (Previously Presented) The apparatus according to Claim 1, wherein the liquid ejection apparatus comprises:

a liquid chamber for accommodating liquid to be ejected at each ink ejecting nozzle.

13. (Previously Presented) The apparatus according to Claim 1, wherein the liquid ejection apparatus comprises:

a liquid chamber for accommodating liquid to be ejected associated with each ink ejecting nozzle;

a heating element arranged within the liquid chamber for generating bubbles in the liquid contained in the liquid chamber by supplying energy;

ink ejecting elements are juxtaposed in each liquid chamber in an arranging direction of the liquid ejection unit heads, and

further comprising a circuit having a switching element connected between the heating elements.

Claims 14. - 15. (Canceled)

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16. (Currently Amended) A liquid ejecting method for controlling the ejection of ink from a line head arranged by longitudinally juxtaposing a plurality of liquid ejection unit heads, each liquid ejection head having a plurality of ink ejecting nozzles and two or more ink ejecting elements associated with each ink ejecting nozzle, the ink ejecting nozzles being arranged in groups by unit heads such that each unit head includes a single group of ink ejecting nozzles, the liquid ejecting method comprising:

providing a principal control means for separately controlling ejection of liquid droplets from each group of ink ejecting nozzles based upon a default operating condition for the respective unit head as manufactured such that substantially the same current values are supplied to the individual ink ejecting elements for each group, wherein current that is supplied to each of the ink ejecting elements of a nozzle in the group is either the same or a different value as set by the principal control means; and

selectively enabling auxiliary control for modifying the default operating condition for at least one group of ink ejecting nozzles relative to the remaining groups of ink ejecting nozzles such that currents different from the default condition are supplied to the ink ejecting elements of the at least one group of ink ejecting nozzles, and further wherein the principal control means operates to generate a principal ink ejection direction that is altered relative to other ink ejecting heads depending upon a detected result, wherein each of the unit heads has a different modified default operating condition.

Claims 17. – 19. (Canceled)

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20. (Previously Presented) The liquid ejection apparatus as set forth in claim 1, further comprising detection means for detecting landing positions of ink ejected by said ink ejecting nozzles in a test pattern and using the results of the detection to determine the amount of modification to apply via the auxiliary control means.

21. (Previously Presented) The liquid ejecting method as set forth in claim 16, further comprising a step of detecting landing positions of ink ejected by said ink ejecting nozzles in a test pattern and using the results of the detection to determine the amount of modification to apply via the auxiliary control selection step.

22. (Previously Presented) The liquid ejection apparatus as set forth in claim 1, wherein said at least one group of ink ejecting nozzles utilizes said modified operating condition in all subsequent print operations.

23. (Previously Presented) The liquid ejecting method as set forth in claim 16, wherein said at least one group of ink ejecting nozzles utilizes said modified operating condition in all subsequent print operations.

24. (Previously Presented) The liquid ejection apparatus as set forth in claim 1, wherein said storage means is a memory element.

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25. (Previously Presented) The liquid ejecting method as set forth in claim 16, wherein said storing step includes storing the modified operating condition in a memory element.

26. (Previously Presented) The liquid ejection apparatus as set forth in claim 1, further comprising a plurality of binary deflection control inputs for determining, step by step, an amount of deflection to be applied to a group of ink ejecting nozzles, and an analog deflection amplitude control input for varying the value of each step.

27. (Previously Presented) The liquid ejecting method as set forth in claim 16, further comprising a plurality of binary deflection control inputs for determining, step by step, an amount of deflection to be applied to a group of ink ejecting nozzles, and an analog deflection amplitude control input for varying the value of each step.